

new declaration. Because one of the co-inventors, Venanzio DiTullio, died subsequent to filing the application, Applicant's attorney currently is seeking the Representative of Decedent's Estate for execution of the new declaration, as specified in 37 C.F.R. 1.42-1.47, and 37 C.F.R. 1.423, MPEP § 409.01 - § 409.03(j). Therefore, it is respectfully requested that the requirement for a new declaration be withdrawn or held in abeyance, until a Notice of Allowance is issued.

### Rejections under 35 U.S.C. § 112

Claims 1-38 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. More particularly, regarding claim 1, the Examiner maintains that in claim 1 step (a), the feature "a pump that **can generate** a pressure of about 200-250 atmospheres" is unclear, because it is unclear whether the reactor system is under a pressure of about 200-250 atmospheres. Applicant respectfully disagrees with the rejection.

It is respectfully submitted that the language of claim 1, when read in light of the specification, is clear and unambiguous. More particularly, the specification makes clear that the reactor system is under pressures ranging from atmospheric pressure to a maximum of about 250 atmospheres (see *e.g.*, Examples 3-8). Reconsideration and withdrawal of the rejection are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to amend claim 1 to further clarify that the reactor system attains a maximum pressure of at least 200-250 atmospheres, which should clarify any perceived ambiguity. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Further, the Examiner maintains that in claim 1 step (c), "it is unclear what - whether product or something else - amines are." Applicant respectfully disagrees with the rejection.

It is respectfully submitted that the language of claim 1 is clear on its face. More particularly, claim 1 clearly recites that "said organic material (*i.e.*, **raw input material**) is **chemically transformed into a mixture comprising .... and, (when protein or other nitrogenous compounds are present in said organic material,) amines.**" Thus, it is clear that, as recited in claim 1, if protein or other nitrogenous compounds are present in the input material, then amines are part of the mixture that is a product of the chemical transformation. The amines limitation of claim 1 is not reasonably susceptible to any other interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 1 are respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. §

2

1.132, providing evidence that one of ordinary skill in the art would understand the meaning of the claims. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Dependent claims 2-38, being dependent upon and further limiting independent claim 1, should also be allowable for that reason, as well as for the additional limitations recited therein. Reconsideration and withdrawal of the indefiniteness rejection of claims 1-38 are therefore respectfully requested.

Claim 4: The Examiner states that "Claim 4 is non-sense since it is unclear why "hydrolysis and decarboxylation occur at a temperature of about 200-430°C" is recited in the claim. There are no relationship between these reactions with the reaction in claim 1 recited in the claim. Further, it is unclear where these two reactions occur." To the extent that Applicant understands the rejection, Applicant respectfully disagrees.

It is respectfully submitted that the language of claim 4, when read in light of the specification, is clear and unambiguous. More particularly, regarding the **relationship between the chemical transformation** recited in step (c) of claim 1 **and the additional recitation of hydrolysis and decarboxylation reactions** in dependent claim 4 (and the reason for that additional recitation): claim 4 is a dependent claim and therefore recites an additional feature (*i.e.*, hydrolysis and decarboxylation), as well as the features of independent claim 1, from which it depends (as is required of any dependent claim). Further, the specification clearly describes the **relationship** between the hydrolysis and decarboxylation reactions of claim 4 and the point at which (*i.e.*, "**where**") they occur during the chemical transformation recited in claim 1:

"It is known in the prior art that classic organic reactions involving these constituents, such as hydrolysis, bond cleavage and bond formation, occur in the sub-critical zone, as described in U.S. Patent No. 4,515,713, and at or above the super-critical temperature of water. *See, e.g., Kuhlmann et al., J. Org. Chem.* 59: 3098-3101 (1994); C.R. Strauss, *Aust. J. Chem.* 52: 83-96 (1999). For example, hydrolysis of esters, thioesters and amides occurs in SCW, and is usually accompanied by decarboxylation. *See, e.g., U.S. Patents No. 5,344,975, No. 5,329,054, and No. 5,630,854, which teach the use of acidic, basic and neutral catalysts, respectively, in such reactions.*" Specification page 2, lines 15-23.

and: "Hydrolysis of the proteins produces a mixture of amino acids; hydrolysis of the triglycerides and lipids produces a mixture of C<sub>4</sub> to C<sub>24</sub>

carboxylic acids, plus glycerol. Decarboxylation of the amino acids and the carboxylic acids generate fractionally distillable carbon dioxide, amines, and C<sub>3</sub> to C<sub>23</sub> hydrocarbons." Specification page 5, lines 7-10; see also the numerous Examples, which detail the points at which hydrolysis and decarboxylation occur.

Thus, hydrolysis and decarboxylation clearly occur during the claimed process, particularly during steps (b) and (c) of claim 1. The language of claim 4 is not reasonably susceptible to any other interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 4 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to amend claim 4 to clarify that hydrolysis and decarboxylation occurs at a temperature of about 200-430°C, during steps b) and/or c), which should clarify any perceived ambiguity. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Claim 7: The Examiner states that "The examiner cannot understand what applicants intend to claim in claim 7. It is unclear what the meaning of simultaneously, independently, in concert or in cascade fashion is." Applicant respectfully disagrees with the rejection.

The standard for indefiniteness is whether one of ordinary skill in the art would understand the meaning of the claims. Absent a specific definition in the specification, claim terms are given their plain, ordinary meaning. The terms "simultaneously, independently, in concert or in cascade fashion" are common terms that are well known in the art and would be understood by one of ordinary skill in the art to have their plain, ordinary meaning. The language of claim 7 is not reasonably susceptible to more than one interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 7 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that one of ordinary skill in the art would understand the meaning of the terms "simultaneously, independently, in concert or in cascade fashion," as recited in claim 7. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Claim 9: The Examiner states that it is unclear what the "liquid phases" are. Applicant respectfully disagrees with the rejection.

4

The term "liquid phase" is well known in the art and would be understood by one of ordinary skill in the art to have its plain, ordinary meaning. The liquid phases are simply the liquids that are collected from the reactor vessel. The language of claim 9 is not reasonably susceptible to more than one interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 9 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that one of ordinary skill in the art would understand the meaning of the term "liquid phase," as recited in claim 9. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

**Claim 10:** The Examiner states that it is unclear what the **"lower viscosity constituents"** are. Applicant respectfully disagrees with the rejection.

The term "lower viscosity constituents" is well known in the art and would be understood by one of ordinary skill in the art to have its plain, ordinary meaning. The language of claim 10 is not reasonably susceptible to more than one interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 10 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that one of ordinary skill in the art would understand the meaning of the term "lower viscosity constituents," as recited in claim 10. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

**Claim 11:** The Examiner states that it is unclear what the **"inorganic phase"** and **"metals-tars-organosulfur contaminants"** are and from which they come.

The terms "inorganic phase" and "metals-tars-organosulfur contaminants" are well known in the art and would be understood by one of ordinary skill in the art to have their plain, ordinary meaning. The language of claim 11 is not reasonably susceptible to more than one interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 11 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that one of ordinary skill in

the art would understand the meaning of the terms "inorganic phase" and "metals-tars-organosulfur contaminants," as recited in claim 11. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Claim 14: The Examiner states that **"any similar organic matter, which is suitable for use in said catalytic reduction process"** is indefinite since it is unclear which matters are and how to know it is suitable.

It is respectfully submitted that, read in light of the specification, one of ordinary skill in the art would understand the types of organic matter that are suitable, particularly based on the range of input materials described in the Examples. The language of claim 14 is not reasonably susceptible to more than one interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 14 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to amend claim 14 to delete the alleged indefinite phrase, which should clarify any perceived ambiguity. . Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Claim 21: The Examiner states that **"The examiner cannot understand claim 21."**

The standard for indefiniteness is whether one of ordinary skill in the art would understand the meaning of the claims. Absent a specific definition in the specification, claim terms are given their plain, ordinary meaning. It is respectfully submitted that the language of claim 21 is clear on its face, and it is not reasonably susceptible to more than one interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 21 are respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that one of ordinary skill in the art would understand the meaning of claim 21. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Claim 23: The Examiner states that it is unclear which ones are hydrolyzed into acids, alcohol, and amines.

Claim 23-28: Further, the Examiner states that "Claims 23-28 are nonsense since it is unclear [whether] the limitations of these claims are required in the process or not. For examples (sic) in claim 23, it is unclear if plastics or protein which contains amides are present in the



organic material or not. If so, claim 25 does have any meaning." To the extent that Applicant understands the rejection, Applicant respectfully disagrees.

It is respectfully submitted that the language of claim 23 is clear on its face, and it is not reasonably susceptible to more than one interpretation, therefore, it cannot be indefinite. It is respectfully submitted that the rejection is thus overcome, and that there are no ambiguities in the claim. Reconsideration and withdrawal of the indefiniteness rejection of claim 23 are respectfully requested.

Dependent claims 24-28, being dependent upon and further limiting claim 23, should also be allowable for the reasons given above, as well as for the additional limitations recited therein. Reconsideration and withdrawal of the indefiniteness rejection of claims 1-38 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the rejection, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that one of ordinary skill in the art would understand the meaning of claim 23. Therefore, should the Examiner maintain the rejection, Applicant requests that the rejection not be made final in the next Office Action.

Applicant believes that these comments have fully addressed the Examiner's rejections, that there are no ambiguities in the claims, and the claims are in condition for allowance. Reconsideration and withdrawal of the indefiniteness rejection of claims 1-38 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the foregoing indefiniteness rejections, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that one of ordinary skill in the art would understand the meaning of the claims. Therefore, should the Examiner maintain any of the rejections, Applicant requests that these rejections not be made final in the next Office Action.

### **Rejections under 35 U.S.C. § 103**

Claims 1-11 and 14-38 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Lee *et al.* (5,386,055). Applicant respectfully disagrees with the rejection.

Applicant's claim 1 recites, *inter alia*, a chemical process for the **catalytic reduction of raw organic materials**. Lee *et al.* does not teach or suggest a chemical process for the catalytic reduction of raw organic materials. Rather, Lee merely teaches **oxidation of synthetic polymers** (*i.e.*, synthetic polymers are not raw organic materials, rather, they are highly processed synthetic compounds). Therefore, the prior art does not teach each and every element of the claimed invention. Further, the Examiner has not identified any teaching or suggestion in the prior art that Lee should be modified from an oxidation process to Applicant's reduction process.

The only such suggestion of record comes from Applicant's disclosure. It is respectfully submitted that the rejection is thus overcome. Reconsideration and withdrawal of the obviousness rejection of claim 1 are therefore respectfully requested. However, contingent upon the Examiner's refusal to withdraw the foregoing obviousness rejection, Applicant proposes to amend claim 1 to more clearly recite a reduction step. Therefore, should the Examiner maintain any of the rejections, Applicant requests that these rejections not be made final in the next Office Action.

Dependent claims 2-11 and 14-38, being dependent upon and further limiting independent claim 1, should also be allowable for that reason, as well as for the additional limitations recited therein. Reconsideration and withdrawal of the obviousness rejection of claims 1-38 are therefore respectfully requested.

Claim 12 was rejected under 35 U.S.C. § 103 (a) as being unpatentable over Lee *et al.* (5,386,055) in view of Diaz *et al.* (4,478,612).

Applicant respectfully disagrees with the rejection, and believes that claim 12 is patentable over Lee *et al.* (5,386,055) in view of Diaz *et al.* (4,478,612), both individually and in combination, for the reasons given above in respect to the section 103 rejection of claim 1, from which claim 12 depends. The argument above as to the non-obviousness of claim 1 is repeated here by reference; Diaz does not cure the deficiencies of Lee. The combination of Lee and Diaz would merely result in a process involving oxidation of synthetic polymers using glycerol as a desiccant, which clearly does not teach or suggest Applicant's claimed process for the **catalytic reduction of raw organic materials**. It is respectfully submitted that the rejection is thus overcome. Reconsideration and withdrawal of the obviousness rejection of claim 12 are therefore respectfully requested.

Claims 13 and 28 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Lee *et al.* (5,386,055) in view of Lin *et al.* (EP 1002767).

Applicant respectfully disagrees with the rejection, and believes that claims 13 and 28 are patentable over Lee *et al.* (5,386,055) in view of Lin *et al.* (EP 1002767), both individually and in combination, for the reasons given above in respect to the section 103 rejection of claim 1, from which claims 13 and 28 depend. The argument above as to the non-obviousness of claim 1 is repeated here by reference; Lin does not cure the deficiencies of Lee. The combination of Lee and Lin would merely result in a process involving oxidation of synthetic polymers using lime to absorb carbon dioxide, which clearly does not teach or suggest Applicant's claimed process for the **catalytic reduction of raw organic materials**. It is respectfully submitted that the

rejection is thus overcome. Reconsideration and withdrawal of the obviousness rejection of claims 13 and 28 are therefore respectfully requested.

Contingent upon the Examiner's refusal to withdraw the foregoing obviousness rejections, Applicant proposes to submit the Declaration of its Expert under 37 C.F.R. § 1.132, providing evidence that the claims would not be obvious to one of ordinary skill in the art. Therefore, should the Examiner maintain any of the obviousness rejections, Applicant requests that these rejections not be made final in the next Office Action.

### Conclusion

Applicant believes that the claims are patentable over the prior art, and that this case is in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with Applicant's attorney would advance the prosecution of the case to finality, he is invited to telephone the undersigned at the number given below.

"Recognizing that Internet communications are not secured, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

Respectfully Submitted:

— *DiTullio et al.* —

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